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(54) Title: PRODUCTION OF BIODEGRADABLE THERMOPLASTIC MATERIALS FROM ORGANIC WASTES

(57) **Abstract:** A system and method for converting organic wastes to biodegradable thermoplastic materials including polyhydroxyalkanoates is disclosed, which method includes treating the organic wastes with an acidogenic microbial population to form fermentative organic acids, and polymerization of the organic acids by PHA-producing microbial species to form PHAs. The system includes a first compartment for acidogenesis of organic wastes without oxygen, and a second compartment, for polymer synthesis by enriched cultures of species with oxygen such as *R. eutropha*, *P. oleovorans*, or mixtures thereof. The compartments are integrated with barriers that permit mass transfer of organic acids while maintaining different culture conditions in the compartments.

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